
IBM ServeRAID Device Driver Installation Instructions

You can use these instructions for the following controllers:

- ServeRAID™-5i
- ServeRAID-4H
- ServeRAID-4M
- ServeRAID-4Mx
- ServeRAID-4L
- ServeRAID-4Lx
- ServeRAID-3H
- ServeRAID-3L
- ServeRAID-II
- ServeRAID

Installing device drivers

This booklet contains information about the device drivers available for the IBM® ServeRAID controllers. This booklet provides instructions for installing the device drivers on the following operating systems:

- Microsoft® Windows® XP Professional (ServeRAID-4Lx controller only)
- Microsoft Windows 2000 Advanced Server, Datacenter, and Server
- Microsoft Windows 2000 Professional (ServeRAID-4Lx controller only)
- Microsoft Windows NT® 4.0 Enterprise Edition and Server
- Novell NetWare (versions 5.x and 6.0)
- IBM OS/2 WARP® Server for e-business
- Red Hat Linux® (versions 6.2, 7.0, 7.1, 7.2, and 7.3)
- SuSE Linux (versions 7.1, 7.2, 7.3, and 8.0)
- Caldera OpenLinux (versions 3.1 and 3.1.1)
- Turbolinux (versions 6.5 and 7.0)
- SCO OpenServer 5.0.6a
- Caldera UnixWare 7.1.1
- Caldera Open UNIX 8.0

The device drivers are contained on the *IBM ServeRAID Support* diskette specific to your operating system. You must create the diskettes using the *IBM ServeRAID Support* CD. For instructions for creating the diskettes, see “Creating ServeRAID diskettes” on page 4.

If you are installing files for a RAID controller that comes as a standard feature on your IBM server system board, use the installation instructions and CDs provided with your server.

If you have multiple ServeRAID controllers in your server and are installing device drivers for Windows 2000 or Windows NT 4.0, see “Installing multiple device drivers on Windows 2000 and Windows NT 4.0” on page 6.

Important:

Verify that all levels of ServeRAID software installed on your server are compatible. In addition to device drivers, the ServeRAID software includes the following:

- BIOS and firmware code
- ServeRAID Manager program
- Command-line programs

If you download ServeRAID software from the World Wide Web, download and install *all* ServeRAID software at the same time.

When using:

Windows XP
Windows 2000
Windows NT 4.0
NetWare
OS/2®
Red Hat Linux

Go to:

“Installing device drivers for Windows XP and Windows 2000” on page 7.
“Installing device drivers for Windows XP and Windows 2000” on page 7.
“Installing device drivers for Windows NT 4.0” on page 10.
“Installing device drivers for NetWare” on page 12.
“Installing device drivers for OS/2 WARP Server for e-business” on page 14.
“Installing device drivers for Red Hat Linux” on page 16.

When using:	Go to:
SuSE Linux	“Installing device drivers for SuSE Linux” on page 18.
Caldera Linux	“Installing device drivers for Caldera OpenLinux” on page 19.
Turbolinux	“Installing device drivers for Turbolinux” on page 20.
OpenServer	“Installing device drivers for SCO OpenServer” on page 21.
UnixWare	“Installing device drivers for Caldera UnixWare or Open UNIX” on page 23.
Open UNIX	“Installing device drivers for Caldera UnixWare or Open UNIX” on page 23.

Creating ServeRAID diskettes

Images for the following diskettes are in the \DISKETTE directory of the *IBM ServeRAID Support* CD. Each of the operating-system specific diskettes contains device drivers and the IPSEND utility.

Note: The IPSMON utility is available only on the *IBM ServeRAID Support for Novell NetWare* diskette.

Diskette image	Diskette
biosfw1.img	<i>IBM BIOS and Firmware Update (1 of 3)</i> for the ServeRAID-5i controller
biosfw2.img	<i>IBM BIOS and Firmware Update (2 of 3)</i> for the ServeRAID-4H, ServeRAID-II, ServeRAID on-board, and the ServeRAID controllers
biosfw3.img	<i>IBM BIOS and Firmware Update (3 of 3)</i> for the ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, ServeRAID-4Lx, ServeRAID-3H, and ServeRAID-3L controllers
failover.img	<i>IBM ServeRAID Failover Support for Windows NT and Windows 2000</i>
clusnt.img	<i>IBM ServeRAID Cluster Solution for Windows NT and Windows 2000</i>
winsrv.img	<i>IBM ServeRAID Support for Windows 2000 Server</i>
winpro.img	<i>IBM ServeRAID Support for Windows (Professional Editions)</i> for Microsoft Windows XP Professional and Microsoft Windows 2000 Professional
os2.img	<i>IBM ServeRAID Support for OS/2</i>
winnt.img	<i>IBM ServeRAID Support for Windows NT 4.0</i>
netware.img	<i>IBM ServeRAID Support for Novell NetWare</i>
openunix.img	<i>IBM ServeRAID Support for Caldera UnixWare and Open UNIX</i>
openserv.img	<i>IBM ServeRAID Support for SCO OpenServer</i>
redhat1.img	<i>IBM ServeRAID Support for Red Hat Linux (1 of 2)</i> for Red Hat Linux, versions 6.2 and 7.0
redhat2.img	<i>IBM ServeRAID Support for Red Hat Linux (2 of 2)</i> for Red Hat Linux, versions 7.1, 7.2, and 7.3
caldera1.img	<i>IBM ServeRAID Support for Caldera OpenLinux (1 of 2)</i> for Caldera OpenLinux, version 3.1
caldera2.img	<i>IBM ServeRAID Support for Caldera OpenLinux (2 of 2)</i> for Caldera OpenLinux, version 3.1.1
suse.img	<i>IBM ServeRAID Support for SuSE Linux</i>
turbo.img	<i>IBM ServeRAID Support for Turbolinux</i>
dos.img	<i>IBM ServeRAID Support for DOS</i>

Creating diskettes on Windows

Complete the following steps to create a diskette:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Insert a blank diskette into the diskette drive.
3. At the DOS or command prompt, type the following and press Enter:

```
e:\diskette\tools\dsk4w32 e:\diskette\disketteimage a:
```

where

- *e* is the drive letter for the CD-ROM drive.
 - *disketteimage* is the name of the diskette image.
 - *a* is the drive letter for the diskette drive.
4. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
 5. Remove the diskette from the diskette drive and label the diskette appropriately.

Creating diskettes on IBM OS/2

Complete the following steps to create a diskette:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Insert a blank diskette into the diskette drive.
3. At the command prompt, type the following and press Enter:

```
e:\diskette\tools\dsk4wrp e:\diskette\disketteimage a:
```

where

- *e* is the drive letter for the CD-ROM drive.
 - *disketteimage* is the name of the diskette image.
 - *a* is the drive letter for the diskette drive.
4. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
 5. Remove the diskette from the diskette drive and label the diskette appropriately.

Creating diskettes on Linux or UNIX

Complete the following steps to create a diskette:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Insert a blank diskette into the diskette drive.
3. At a command prompt, mount the CD-ROM drive by typing one of the following:

For Linux	<code>mount -t iso9660 /dev/cdromdevicefile /mountpoint</code>
------------------	--

For OpenServer	<code>mount -r -f ISO9660 /dev/cdromdevicefile /mountpoint</code>
-----------------------	---

For UnixWare and Open UNIX	<code>mount -f cdfs /dev/cdromdevicefile /mountpoint</code>
-----------------------------------	---

where *cdromdevicefile* is the specific device file for the CD-ROM block device, and *mountpoint* is the mountpoint of the CD-ROM drive.

4. Press Enter.
5. At the command prompt, type the following:

```
dd if=/mnt/diskette/disketteimage of=/dev/diskettedevicefile bs=32k
```

where

- *disketteimage* is the name of the diskette image.
- *diskettedevicefile* is the specific device file for the diskette block device.

6. Press Enter.
7. Unmount the CD-ROM drive. Type the following and press Enter:

```
umount /mountpoint
```

where *mountpoint* is the mountpoint of the device file used in step 3 on page 5.
8. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
9. Remove the diskette from the diskette drive and label the diskette appropriately.

Installing multiple device drivers on Windows 2000 and Windows NT 4.0

If you install more than one ServeRAID controller in a server, you might need to install two ServeRAID device drivers. The following groups of ServeRAID controllers use two different device drivers.

	Group 1	Group 2
Device driver	i960	powerpc
Controllers	ServeRAID-4M ServeRAID-4Mx ServeRAID-4L ServeRAID-4Lx ServeRAID-5i	ServeRAID-4H ServeRAID-3H ServeRAID-3L ServeRAID-II ServeRAID

If you install *only* Group 1 or *only* Group 2 ServeRAID controllers in a server, you will only need to install one device driver. However, if you install both Group 1 and Group 2 ServeRAID controllers in a server, you must install two device drivers. In the following procedures, use the i960 device driver for Group 1 controllers and use the powerpc device driver for Group 2 controllers.

ServeRAID device driver order on Windows 2000 and Windows NT 4.0

If you install a Group 1 and a Group 2 controller in a server, the order in which the devices are listed for Windows 2000 and Windows NT 4.0 might not match the order in which the devices are listed in the startable (bootable) ServeRAID Manager program on the *IBM ServeRAID Support* CD and the ServeRAID Mini-Configuration program.

The startable ServeRAID Manager and the ServeRAID Mini-Configuration programs determine the order in which the controllers are listed in the following way. The programs scan the PCI slots until they detect a ServeRAID controller. The programs, which recognize controllers as members of either Group 1 or Group 2 (see preceding table), then list all the controllers of the first type scanned before the controllers of the other type.

For example, a server has four ServeRAID controllers installed in the following PCI-scan order:

1. ServeRAID-4Mx
2. ServeRAID-4H
3. ServeRAID-4Lx
4. ServeRAID-3H

Because the first controller scanned is a ServeRAID-4Mx, all ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, and ServeRAID-4Lx controllers (Group 1) are listed first. Subsequently, all other ServeRAID models (Groups 2) are listed. In this example, the ServeRAID Manager and ServeRAID Mini-Configuration programs will list controllers in the following order:

1. ServeRAID-4Mx
2. ServeRAID-4Lx
3. ServeRAID-4H
4. ServeRAID-3H

Note: To determine the PCI-slot scan order, refer to your server documentation.

In contrast, both Windows 2000 and Windows NT 4.0 order SCSI controllers based on the order in which device drivers are loaded. For example, the device driver that is loaded first has its controllers listed first. Then, the device driver that is loaded second has its controllers listed second, and so on.

When you install Windows NT 4.0, the order in which you add device drivers to the server is the order in which the device driver is loaded. You can control the order in which the controllers are listed by installing the device drivers for the controllers in the same order that you want to have them listed.

However, when you install Windows 2000, the powerpc device driver is included on the *Windows 2000* CD and is loaded before any device drivers you add at installation time, such as the i960 device driver. You can change the load order on Windows 2000 *only* by editing the Windows registry after installation.

Note: Refer to Microsoft knowledge base articles Q141832 and Q115486 for more information about editing the Windows registry to control the order in which the device drivers are loaded and the order in which the controllers are listed.

Installing device drivers for Windows XP and Windows 2000

Use the following instructions when you do one of the following:

- Install device drivers while installing Windows XP or Windows 2000
- Install device drivers after installing Windows XP or Windows 2000
- Update device drivers after installing Windows XP or Windows 2000

You will need one of the following diskettes:

- *IBM ServeRAID Support for Windows 2000 Server*
- *IBM ServeRAID Support for Windows (Professional Editions)*
- *IBM ServeRAID Failover Support for Windows NT and Windows 2000*

Use the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette only if you are configuring a failover environment. For information about creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

Installing device drivers while installing Windows XP or Windows 2000

Use the following instructions when you do one of the following:

- Install device drivers for a ServeRAID-4H, ServeRAID-3H, ServeRAID 3L, ServeRAID-II, or ServeRAID controller
- Install device drivers for a ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, ServeRAID-4L, or ServeRAID-5i controller

Installing device drivers for a ServeRAID-4H, ServeRAID-3, ServeRAID-II, or ServeRAID controller

Note: These instructions are for Windows 2000 only.

When installing Windows 2000, you must install the ServeRAID device driver that comes on the *Windows 2000* CD. The Windows installation program does not allow you to upgrade the device driver that comes with the installation CD. After installing Windows 2000, you *must* update the ServeRAID device driver to the latest version. Refer to “Updating device drivers after installing Windows XP or Windows 2000” on page 9.

Installing device drivers for a ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, ServeRAID-4L, or ServeRAID-5i controller

Note: Windows 2000 Professional and Windows XP Professional are supported on the ServeRAID-4Lx controller only.

Complete the following steps to install the ServeRAID device driver for ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, ServeRAID-4L, or ServeRAID-5i controllers while installing Windows XP or Windows 2000:

1. Insert the appropriate *Windows* CD into the CD-ROM drive; then, restart the server.
2. A few seconds after restarting the server, when the message
Press F6 if you need to install a third party SCSI or RAID driver...

is displayed, press F6.

Note: This message is displayed immediately after the screen changes from black to blue. You have only a few seconds to press F6.

3. After loading some files, Windows will display a screen where you can manually specify a controller. When this screen is displayed, press the S key to specify additional devices.
4. When prompted to insert the manufacturer-supplied hardware support disk, insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive; then, press Enter.
5. From the menu, select the appropriate controller and operating system; then, press Enter. A message similar to the following appears:
Setup is loading files (IBM ServeRAID 4M/4Mx/4L/4Lx Controller (Windows 2000 and XP-Beta Servers))...
6. When prompted, press Enter to continue.
7. Use the instructions provided in the Windows manual to complete the normal installation process.
8. After you complete the installation, install the latest operating system service pack.

Note: If you used the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

Installing device drivers after installing Windows XP or Windows 2000

You can install the ServeRAID device driver *only* when installing a new ServeRAID controller in the server. During that time, Windows detects new hardware. After the “New Hardware Found” window is displayed, do the following:

1. Click **Next**; the Install Hardware Device Drivers window appears.
2. Select the **Search for a suitable driver for my device** check box; click **Next**.
3. The Locate Drivers File window appears. Select the **Floppy disk** check box, and insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive. Click **Next**.
4. The Driver Files Search Results window appears; when Windows finds the appropriate device driver, click **Next**.

If the Digital Signature Not Found window appears, click **Yes**.

5. The Completing the Found New Hardware Wizard window appears; click **Finish**.

Note: If you used the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

Updating device drivers after installing Windows XP or Windows 2000

Note: (Windows 2000 only) If you have more than one ServeRAID controller installed in the server and the controllers require different device drivers (see “Installing multiple device drivers on Windows 2000 and Windows NT 4.0” on page 6), repeat the following procedure for each device driver you are updating.

Complete the following steps to update the ServeRAID device driver after installing Windows XP or Windows 2000:

1. Insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive.
2. Click **Start** → **Programs** → **Administrative Tools** → **Computer Management**. The Computer Management window opens.
3. In the left pane, click **Device Manager**.
4. In the right pane, click the SCSI adapters and RAID controllers to display all the controllers in the server.
5. Right-click the first ServeRAID controller in the tree; then, click **Properties**. The Properties window opens.

Note: (Windows 2000 only) If you have more than one ServeRAID controller installed in the server *and* the controllers require different device drivers, click the first ServeRAID controller in the tree that belongs to the group for which you are installing the device driver.

6. Click the **Driver** tab; then, click **Update Driver**. The Update Device Driver Wizard opens.
7. Click **Next**.
8. Select **Display a list of the known drivers**; then, click **Next**.
9. Click **Have Disk**.

10. In the **Copy manufacturer's files from** field, type one of the following:

For ServeRAID-5i, ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, ServeRAID-4L controllers	If you are running Windows 2000 Server, type: <code>a:\win2ksrv\driver\i960</code>
	If you are running Windows XP Professional or Windows 2000 Professional, type: <code>a:\winpro\driver\i960</code>
For ServeRAID-4H, ServeRAID-3H, ServeRAID-3L, ServeRAID-II, and ServeRAID controllers	If you are running Windows 2000 Server, type: <code>a:\win2ksrv\driver\powerpc</code>
	If you are running Windows 2000 Professional, type: <code>a:\winpro\driver\powerpc</code>
For a failover configuration	If you are running Windows 2000 Server, type: <code>a:\failover\driver\win2k</code>

where *a* is the diskette drive letter.

11. Click **OK**; the Select a Device Driver window opens.
12. In the **Models** list box, select the appropriate ServeRAID controller; then, click **Next**.
13. The Start Device Driver Installation window opens; click **Next**.
14. After the device driver is installed, remove the diskette or the CD from the drive, and restart the server.

Note: If you used the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

Installing device drivers for Windows NT 4.0

Use the following instructions when you do one of the following:

- Install device drivers while installing Windows NT 4.0
- Install *or* update device drivers after installing Windows NT 4.0

You will need one of the following diskettes:

- *IBM ServeRAID Support for Windows NT*
- *IBM ServeRAID Failover Support for Windows NT and Windows 2000*

Use the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette only if you are configuring a failover environment. For information about creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

Installing device drivers while installing Windows NT 4.0

Complete the following steps to install the ServeRAID device driver while installing Windows NT 4.0:

1. Insert the startable Windows NT 4.0 CD into the CD-ROM drive, or insert the Windows NT 4.0 startup (boot) diskette into the diskette drive.
2. Restart the server.

3. When the message
Setup is inspecting your computer's hardware configuration...

is displayed, press F6.

Note: After the message is displayed, you have only a few seconds to press F6.
4. After loading some files, Windows displays a screen where you can manually specify a controller. When this screen appears, press the S key to specify additional devices.
5. When prompted in the next window, select **Other** from the list.
6. When prompted to insert the manufacturer-supplied hardware support disk, insert the *IBM ServeRAID Support for Windows NT 4.0* diskette into the diskette drive; then, press Enter.
7. Select **IBM ServeRAID 4M/4Mx/4L/4Lx/5i Controller** if you are installing one of the following controllers: ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, ServeRAID-4Lx, or ServeRAID-5i. Otherwise, select **IBM ServeRAID 2x/3x/4H Controller**.
8. A message similar to the following is displayed:
Setup is loading files (IBM ServeRAID 4M/4L Controller (NT 4.0))...
9. When prompted, press Enter to continue.
10. Use the instructions provided in the Windows NT 4.0 manual to complete the normal installation process.
11. After you complete the installation, install the latest operating system service pack.

Note: If you used the *IBM ServeRAID Failover Support for Windows NT and Windows 2000* diskette, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

Installing or updating device drivers after installing Windows NT 4.0

Note: If you have more than one ServeRAID controller installed in the server and the controllers require different device drivers (see “Installing multiple device drivers on Windows 2000 and Windows NT 4.0” on page 6), repeat the following procedure for each device driver you are updating.

Complete the following steps to install or update the ServeRAID device driver after installing Windows NT 4.0:

1. Insert the *IBM ServeRAID Support for Windows NT 4.0* diskette into the diskette drive.
2. Click **Start** → **Settings** → **Control Panel**.
3. Select SCSI Adapter; then, click the **Drivers** tab.
4. Click **Add**; then, click **Have Disk**.
5. In the **Copy manufacturer's files from** field, type the following:
`a:\winnt\driver`

where *a* is the diskette drive letter.
6. Click **OK**; then in the next window, click **OK** again.

7. Select **IBM ServeRAID 4M/4Mx/4L/4Lx/5i Controller** if you are installing one of the following controllers: ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, ServeRAID-4Lx, or ServeRAID-5i. Otherwise, select **IBM ServeRAID 2x/3x/4H Controller**.
8. After the device driver is installed, remove the diskette from the drive, and restart the server.

Installing device drivers for NetWare

Use the following instructions when you do one of the following:

- Install device drivers while installing NetWare
- Install *or* update device drivers after installing NetWare

You will need the *IBM ServeRAID Support for Novell NetWare* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing NetWare

Complete the following steps to install the ServeRAID device driver while installing NetWare 5.x or 6.x:

1. Use the instructions provided in the NetWare manual to begin the installation.
2. When the Choose the Server Drivers - Disk Driver prompt appears during the installation process, insert the *IBM ServeRAID Support for Novell NetWare* diskette.
3. Click **Select additional or modify selected Disk/LAN drivers**.
4. If the list contains IPSRAID drivers, select the IPSRAID drivers; then, select the **Deselect a selected driver** check box.
5. Click **Select an additional driver**; then, press the Ins (Insert) key to add an unlisted device driver.
6. Press F3 to specify a path; then, type one of the following:

If installing NetWare 5.x	<i>a</i> :\netware5
If installing NetWare 6.x	<i>a</i> :\netware6

where *a* is the diskette drive letter.

7. Click **IPSRAID.HAM** from the list of device drivers that appears in the window; then, press Enter.

Note: The IPSRAID.HAM and support files will be copied to the system volume.

8. Click **OK** to overwrite the existing files.
9. Follow the instructions in the NetWare manual to complete the installation.

Installing or updating device drivers after installing NetWare

Note: If the device driver is already installed, do the following before starting this procedure:

1. From the system console, type the following and press Enter:
Unload IPSRAID
2. Go to step 1 in the following instructions.

Complete the following steps to install or update the ServeRAID device driver after installing NetWare5.x or 6.x:

1. Start the NetWare installation utility program. From the system console, type the following and press Enter:
`load nwconfig`
2. Insert the *IBM ServeRAID Support for Novell NetWare* diskette into the diskette drive.
3. In the Installation Options list, click **Driver options**.
4. In the Driver Options window, click **Configure disk and storage**.
5. In the Additional Drivers Actions window, select **Select an additional driver**.
6. When the next window opens, press the Ins (Insert) key to install an unlisted driver.
7. When the next window opens, press F3 to specify a different path.
8. In the **Specify a directory path** field, type one of the following and press Enter:

If installing NetWare 5.x	<code>a:\netware5</code>
If installing NetWare 6.x	<code>a:\netware6</code>

where *a* is the diskette drive letter.

9. When prompted to select a device driver to install, select **IPSRAID.HAM**.
10. Click **Yes** when prompted to copy the IPSRAID.HAM device driver.
11. When the prompt appears to specify the server boot path, type the following and press Enter:

`c:\nwserver`

Notes:

- a. If you did not install NetWare in the NWSERVER directory on drive C, modify step 11 accordingly.
 - b. If any of the files you are installing already exist on the server, NetWare will prompt you to save the older files. Although it is not necessary to save the older files, it might be useful to do so.
12. After the installation program copies all the files, verify the ServeRAID slot number using the Driver IPSRAID Parameter Actions window.
 13. Click **Save Parameters and load driver** to load the ServeRAID device driver.

Note: If the device driver is not installed already and the operating system is installed, an error message stating that the device driver failed to load should appear after you complete the previous step. If that happens, do the following:

- a. Press Esc to exit from the installation screens.
 - b. Shut down the server.
 - c. Restart the server. From the system prompt, type server and press Enter.
 - d. The server automatically loads and installs the device driver.
14. Press Esc to exit from the installation screens.

15. From the system console, type the following and press Enter:

```
mount all
```

Note: If you want NetWare to load the ServeRAID device driver automatically during startup, you must add the appropriate LOAD command (for example, load ipsraid.ham slot=1) to the NetWare startup command file (usually C:\NWSERVER\STARTUP.NCF).

Installing device drivers for OS/2 WARP Server for e-business

Use the following instructions when you do one of the following:

- Install device drivers while installing OS/2 WARP Server for e-business
- Install *or* update device drivers after installing OS/2 WARP Server for e-business

You will need the *IBM ServeRAID Support for IBM OS/2* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing OS/2 WARP Server for e-business

You can use the following instructions to install the ServeRAID device driver files while installing OS/2.

Note: During the OS/2 installation, you might receive the following messages:

- * Initializing Raid SCSI Subsystem.
- * Unable to allocate IRQ resources.
- * RMCreat Device Adapter failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.

If you receive these messages, disregard them during installation. The installation will be completed successfully. After the installation is complete, install the updated RESOURCE.SYS file available from the OS/2 Device Driver Pak On-Line Web site:

<http://service.software.ibm.com/os2ddpak/index.htm>

At this Web site, follow these steps to obtain the updated RESOURCE.SYS file:

1. Scroll down to the bottom, and click **I have read the Program License Agreement and AGREE to its terms.**
2. Scroll down, and select **OS/2 Component Updates** from the list.
3. Select **OS/2 Base Device Driver Updates.**
4. Click **RESOURCE.SYS update; pre-requisite for updated IBM RAID Driver.**
5. Follow the instructions at the Web site for installing the RESOURCE.SYS update after you have installed OS/2.

Complete the following steps to install the ServeRAID files while installing OS/2:

1. Make a copy of the *OS/2 WARP Server for e-business Diskette 1* and label it “Copy of OS/2 Diskette 1.”
2. Insert the *IBM ServeRAID Support for OS/2* diskette into the diskette drive.

3. Copy the IPSRAID.ADD file from the following directory to the “Copy of OS/2 Diskette 1” diskette:

`a:\OS2\driver`

where *a* is the diskette drive letter.

If there is not enough space, delete files not needed in your installation (such as proprietary CD-ROM or SCSI device drivers). Make sure you remove all entries referring to any device drivers you delete from the CONFIG.SYS file.

4. Edit the CONFIG.SYS file on the “Copy of OS/2 Diskette 1” to add the following lines:

```
BASEDEV=IPSRAID.ADD  
SET COPYFROMFLOPPY=1
```

5. Install OS/2, but when you are prompted to insert Diskette 1, use the updated “Copy of OS/2 Diskette 1.”
6. Edit the CONFIG.SYS file and verify that there is only one copy of the line BASEDEV=IPSRAID.ADD.

Notes:

- a. If you have more than one ServeRAID or SCSI adapter in your server, make sure that the BASEDEV statement for the adapter or controller controlling the startup (boot) device appears in the CONFIG.SYS file before the BASEDEV statements for the other ServeRAID or SCSI adapters.
- b. After you install any service packs, check the path for the IPSRAID.ADD device driver, and verify that the correct device driver is installed.

Installing or updating device drivers after installing OS/2 WARP Server for e-business

Complete the following steps to install the ServeRAID files after installing OS/2:

1. After you complete the OS/2 installation, insert the *IBM ServeRAID for IBM OS/2* diskette.

2. From an OS/2 window, type the following and press Enter:

`a:`

where *a* is the diskette drive letter.

3. Type the following and press Enter:

```
ddinstal
```

4. The OS/2 Device Driver Installation window opens and prompts you for the source and destination drives. The source directory is the diskette drive where the *IBM ServeRAID Device Drivers* diskette is inserted. The destination directory is where the program will copy the device driver files.
5. Click **Install**. The program does the following:
 - Copies the following ServeRAID device driver statement to your CONFIG.SYS file: BASEDEV=IPSRAID.ADD
 - Copies the IPSRAID.ADD ServeRAID device driver to the OS/2 subdirectory on your hard disk.
6. Open the CONFIG.SYS file and verify that there is only one copy of the line BASEDEV=IPSRAID.ADD.

Notes:

- a. If you have more than one ServeRAID or SCSI adapter in your server, make sure that the BASEDEV statement for the adapter or controller controlling the

- startup (boot) device appears in the CONFIG.SYS file before the BASEDEV statements for the other ServeRAID or SCSI adapters.
- b. After you install any service packs, check the path for the IPSRAID.ADD device driver, and verify that the correct device driver is installed.
7. Restart the server.

Note: When starting OS/2 after installing the new ServeRAID device driver, you might receive the following messages:

- * Initializing Raid SCSI Subsystem.
- * Unable to allocate IRQ resources.
- * RMCreat Device Adapter failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.
- * RMCreat Device (disk) failure.

If you receive these messages, disregard them during installation. The installation will be completed successfully. After the installation is complete, install the updated RESOURCE.SYS file available from the OS/2 Device Driver Pak On-Line Web site:

<http://service.software.ibm.com/os2ddpak/index.htm>

At this Web site, follow these steps to obtain the updated RESOURCE.SYS file:

- a. Scroll down to the bottom, and click **I have read the Program License Agreement and AGREE to its terms.**
- b. Scroll down and click **OS/2 Component Updates** from the list.
- c. Click **OS/2 Base Device Driver Updates.**
- d. Click **RESOURCE.SYS update; pre-requisite for updated IBM RAID Driver.**
- e. Follow the instructions at the Web site for installing the RESOURCE.SYS update after you have installed OS/2.

Installing device drivers for Red Hat Linux

Use the following instructions when you do one of the following:

- Install device drivers while installing Red Hat Linux
- Install *or* update device drivers after installing Red Hat Linux

You will need one of the following diskettes:

For Red Hat Linux, versions 6.2 *IBM ServeRAID Support for Red Hat Linux (1 of 2) and 7.0*

For Red Hat Linux, versions 7.1, *IBM ServeRAID Support for Red Hat Linux (2 of 2) 7.2, and 7.3*

For information about creating the diskettes, see “Creating ServeRAID diskettes” on page 4.

If you are installing Red Hat Linux, version 6.2 or 7.0, you will also need an *Updated Red Hat Installation* diskette. For information on creating this diskette, see “Creating the Updated Red Hat Installation diskette” on page 17.

Creating the Updated Red Hat Installation diskette

Complete the following steps to create the *Updated Red Hat Installation* diskette on Windows, Linux, or OS/2:

1. Go to the Red Hat Web site:

http://www.redhat.com/support/errata/partners/ibm/ibm_netfinity.html

2. Download one of the following diskette images:

For Red Hat Linux, version 6.2	updrh62.img
For Red Hat Linux, version 7.0	Netfinity-bootdisk-rh-7.0.i386.img

Note where you download the diskette image.

3. If you are creating the diskette on Linux, go to step 4. Otherwise, insert the *IBM ServeRAID Support* CD into the CD-ROM drive.

If the ServeRAID Manager Setup program starts, click **Cancel**; then, click **Exit Setup**.

4. Insert a formatted diskette into the diskette drive.
5. Do one of the following:

For Windows XP, Windows 2000, Windows NT 4.0, Windows Me, Windows 98, or Windows 95	At the DOS or command prompt, type the following: <code>e:\diskette\tools\disk4w32 c:\directoryname\disketteimage a:</code>
--	--

For Linux	At the command prompt, type the following: <code>dd if=/tmp/disketteimage of=/dev/diskettefile bs=32k</code>
------------------	---

For OS/2	At an OS/2 prompt, type the following: <code>e:\diskette\tools\disk4wrp c:\directoryname\disketteimage a:</code>
-----------------	---

where

- *a* is the drive letter of the diskette drive, and *e* is the drive letter of the CD-ROM drive.
 - (For Windows and OS/2 only) *c:\directoryname* is the location of the downloaded diskette image.
 - (For Linux only) *tmp* is the location of the downloaded diskette image.
 - *disketteimage* is the name of the *Updated Red Hat Installation* diskette image.
 - *diskettefile* is the specific device file for the diskette block device. Typically, this is *fd0*.
6. Press Enter.
 7. Remove the diskette from the diskette drive, and label it “Updated Red Hat Installation” diskette.
 8. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.

Installing device drivers while installing Red Hat Linux

Complete the following steps to install the ServeRAID device driver while installing Red Hat Linux:

1. If you are installing Red Hat Linux, versions 6.2 or 7.0, insert the *Updated Red Hat Installation* diskette into the diskette drive. Otherwise, insert the *Red Hat Installation* CD into the CD-ROM drive.
2. Turn on or restart the server.

3. At the command prompt, type:
`Linux dd`

and any other options for your installation; then, press Enter.
4. If you are installing Red Hat Linux, version 6.2 or 7.0, insert the *Red Hat Installation* CD into the CD-ROM drive. Otherwise, go to step 5.
5. Follow the prompts to complete the installation.

Installing or updating device drivers after installing Red Hat Linux

Complete the following steps to install or update device drivers after installing Red Hat Linux:

1. Insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive.
2. Type the following and press Enter:

```
mount -t vfat /dev/diskettedevicefile /mnt/floppy
```

where *diskettedevicefile* is the specific device file for the diskette block device. Typically, this is `fd0`.

3. Type the following and press Enter:
`cd /mnt/floppy`
4. Type the following and press Enter:
`sh updrh.sh`
5. Type the following and press Enter:
`cd /`
6. Type the following and press Enter:
`umount /mnt/floppy`
7. Remove the diskette from the diskette drive.
8. Restart your server by typing:
`shutdown -r now`
9. Press Enter.

Installing device drivers for SuSE Linux

Use the following instructions when you do one of the following:

- Install device drivers while installing SuSE Linux
- Install *or* update device drivers after installing SuSE Linux

You will need the *IBM ServeRAID Support for SuSE Linux* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Note: The ServeRAID SuSE Linux 7.1 device driver is supported using only the 2.2.18 kernel.

Installing device drivers while installing SuSE Linux

Complete the following steps to install device drivers while installing SuSE Linux:

1. Insert the *SuSE Installation* CD into the CD-ROM drive.
2. Turn on or restart the server. The opening screen appears.
3. When the boot prompt appears, press the left Alt key.
4. When the installation program displays the message “Driver Update floppy” in the lower right-hand corner of the screen, insert the *IBM ServeRAID Support for SuSE Linux* diskette into the diskette drive and press Enter.

5. Follow the prompts to complete the installation.

Installing or updating device drivers after installing SuSE Linux

Complete the following steps to install or update device drivers after installing SuSE Linux:

1. Insert the *IBM ServeRAID Support for SuSE Linux* diskette into the diskette drive.
2. Type the following and press Enter:

```
mount /dev/diskette/devicefile /floppy
```

where *diskette/devicefile* is the specific device file for the diskette block device. Typically, this is /dev/fd0.

3. Type `cd /floppy` and press Enter.
4. Type `sh update.sh` and press Enter.
5. Type `cd /` and press Enter.
6. Type `umount /floppy` and press Enter.
7. Remove the diskette from the diskette drive.
8. Type the following and press Enter to restart the server.

```
shutdown -r now
```

Installing device drivers for Caldera OpenLinux

Use the following instructions when you do one of the following:

- Install device drivers while installing Caldera OpenLinux
- Install *or* update device drivers after installing Caldera OpenLinux

You will need one of the following diskettes:

For Caldera OpenLinux, version 3.1 *IBM ServeRAID Support for Caldera OpenLinux (1 of 2)*

For Caldera OpenLinux, version 3.1.1 *IBM ServeRAID Support for Caldera OpenLinux (2 of 2)*

For information about creating the diskettes, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing Caldera OpenLinux

Complete the following steps to install the ServeRAID device driver while installing Caldera OpenLinux:

1. Insert the *Caldera Installation* CD into the CD-ROM drive.
2. Turn on or restart the server.
3. When the Caldera Systems OpenLinux screen appears, select **Select install mode (recommend)**. Press E.
4. Using the Down Arrow (↓) key, select **kernel/vmlinux**. Press E.
5. At the end of the line, type the following and press Enter.

```
er=modules
```
6. Press B.
7. When the “Mounting module disk” message appears, insert the appropriate *IBM ServeRAID Support for Caldera OpenLinux* diskette into the diskette drive.
8. Follow the prompts to complete the installation.

Installing device drivers after installing Caldera OpenLinux

Complete the following steps to install or update device drivers after installing Caldera OpenLinux:

1. Insert the appropriate *IBM ServeRAID Support for Caldera OpenLinux* diskette into the diskette drive.

2. Type the following and press Enter:

```
mount /dev/diskette/devicefile /mnt/floppy
```

where *diskette/devicefile* is the specific device file for the diskette block device.

3. Type the following and press Enter:

```
cd /mnt/floppy
```

4. Type the following and press Enter:

```
sh update.sh
```

5. Type the following and press Enter:

```
cd /
```

6. Type the following and press Enter:

```
umount /mnt/floppy
```

7. Remove the *IBM ServeRAID Support for Caldera OpenLinux* diskette from the diskette drive.

8. Restart your server by typing the following and pressing Enter:

```
shutdown -r now
```

Installing device drivers for Turbolinux

Use the following instructions when you do one of the following:

- Install device drivers while installing Turbolinux
- Install *or* update device drivers after installing Turbolinux

You will need the *IBM ServeRAID Support for Turbolinux* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing Turbolinux

Complete the following steps to install the ServeRAID device driver while installing Turbolinux:

1. Insert the *Turbolinux Installation* CD into the CD-ROM drive.
2. At the boot prompt, type one of the following and press Enter:

If installing version 6.5	<code>install noprobe</code>
----------------------------------	------------------------------

If installing version 7.0	<code>dd updates</code>
----------------------------------	-------------------------

3. When the “Choose a Language” screen appears, select the appropriate language.
4. Insert the *IBM ServeRAID Support for Turbolinux* diskette into the diskette drive. If you are installing Turbolinux version 7.0, go to step 9 on page 21. Otherwise, go to step 5.
5. When prompted “Would you like to load any special device driver now,” select **Add Device**.
6. For the device type, select **SCSI**.
7. Press F2 to access your driver disk.

8. Select **IBM ServeRAID driver**, and then select **Done**.
9. Follow the prompts to complete the installation.

Installing or updating device drivers after installing Turbolinux

Complete the following steps to install or update device drivers after installing Turbolinux:

1. Insert the *IBM ServeRAID Support for Turbolinux* diskette into the diskette drive.
2. Type the following and press Enter:

```
mount /dev/diskette/devicefile /mnt/floppy
```

where *diskette/devicefile* is the specific device file for the diskette block device. Typically, this is fd0.

3. Type the following and press Enter:

```
cd /mnt/floppy
```
4. Type the following and press Enter:

```
sh update.sh
```
5. Type the following and press Enter:

```
cd /
```
6. Type the following and press Enter:

```
umount /mnt/floppy
```
7. Remove the diskette from the diskette drive.
8. Restart your server by typing the following and pressing Enter:

```
shutdown -r now
```

Installing device drivers for SCO OpenServer

Use the following instructions when you do one of the following:

- Install device drivers while installing SCO OpenServer
- Install *or* update device drivers after installing SCO OpenServer

You will need the *IBM ServeRAID Support for SCO OpenServer* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing SCO OpenServer

Before you begin the installation, review the following information:

- You must install logical drives as Bus Number 0 when using the MKDEV program, regardless of the channel that the physical drives are on.
- You must install a nondisk device, such as a CD-ROM drive or tape drive, as Bus Number 1, 2, 3, or 4 relative to the channel to which it is attached. Internal Channel 1 is Bus Number 1, Internal Channel 2 is Bus Number 2, External Channel 1 is Bus Number 1, External Channel 2 is Bus Number 2, External Channel 3 is Bus Number 3, and External Channel 4 is Bus Number 4.

Complete the following steps to configure the default nondisk devices during the initial installation:

1. Redefine the default tape drive in the initial boot string. For example, to install the boot-time loadable driver IPSRAID BTLD and redefine the tape drive, go to the B00T prompt and type:

```
link Stp=ips(0, 1, 2, 0)
```

where the numbers in parentheses represent the host adapter number, the bus number, the SCSI ID, and the logical unit number (LUN) respectively.

2. When prompted for the location of the installation CD, change the bus number and SCSI ID, as required.

Adding IPSRAID BTLD at startup time

Complete the following steps to install the ServeRAID device driver for SCO OpenServer 5.0.5 and 5.0.6:

1. At the B00T prompt, type the following and press Enter:

```
link
```

2. When prompted for the name of the package, type the following and press Enter:

```
ipsraid
```

3. After the kernel loads but before it runs, the link program prompts you to insert the *IBM ServeRAID Support for SCO OpenServer* diskette.

While the installation program copies the files, one or both of the following messages might appear:

- Extracting BTLD distribution for ipsraid... /etc/uadmin getdev b ips:
No such device (error 19)
- dynamic linker: dlvr_audit: Cannot open /dev/zero for file
/lib/libprot.so.1

You can ignore the first message; if the second message appears, however, you must press Enter when prompted to continue the installation.

4. Keep the *IBM ServeRAID Support for SCO OpenServer* diskette available. You will need it to configure the device driver into the link kit.

For additional information about adding a boot-time loadable driver at boot time, refer to "Using Boot-Time Loadable Drivers" in the *SCO OpenServer Handbook*.

Installing or updating device drivers after installing OpenServer

Complete the following steps to install or update device drivers after installing SCO OpenServer:

1. Start the server in system maintenance mode, and log in as ROOT.
2. Type the following and press Enter:

```
installpkg
```

3. Select the diskette drive into which you will insert the installation diskette.
4. When prompted, insert the *IBM ServeRAID Support for SCO OpenServer* diskette.
5. When prompted for the name of the package, type the following and press Enter:

```
ipsraid
```

6. To relink the kernel (as described in “Relinking the kernel” in the *SCO OpenServer Handbook*), type the following command and press Enter:
`cd /etc/conf/cf.d`
7. Type the following and press Enter:
`./link_unix`
8. After the kernel rebuilds, the following message appears:
The UNIX kernel has been rebuilt. Do you want this kernel to boot by default?
To continue, type y
The system backs up the old kernel by moving /unix to /unix.old.
9. When the system asks for the kernel environment to be rebuilt, type y
The system will respond with a message.
10. Remove the *IBM ServeRAID Support for SCO OpenServer* diskette from the diskette drive.
11. Shut down the server; then, restart the server.

Installing device drivers for Caldera UnixWare or Open UNIX

Use the following instructions when you do one of the following:

- Install device drivers while installing Caldera UnixWare or Open UNIX
- Install *or* update device drivers after installing Caldera UnixWare or Open UNIX

You will need the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette. For information about creating the diskette, see “Creating ServeRAID diskettes” on page 4.

Installing device drivers while installing Caldera UnixWare or Open UNIX

The instructions that you use for installing the ServeRAID files when using Caldera UnixWare or Open UNIX depend on the number of IDE and SCSI disk-storage adapters and controllers installed in the server. If all of the direct-access-storage devices (DASD) in the server are attached to a single disk-storage adapter or controller (such as the ServeRAID controller), go directly to “Installing the device drivers while installing Caldera UnixWare or Open UNIX” on page 26.

Attaching devices to multiple disk-storage adapters or controllers

If you are attaching devices to multiple disk-storage adapters or controllers (including IDE and SCSI controllers integrated on the system board), use the following instructions.

- If you are installing Caldera UnixWare or Open UNIX on a drive attached to a ServeRAID controller, follow the instructions in “Installing Caldera UnixWare or Open UNIX on a ServeRAID drive” on page 24.
- If you are installing Caldera UnixWare or Open UNIX on a drive attached to a non-ServeRAID adapter or controller and you intend to store only data on the drives attached to your ServeRAID controllers, follow the instructions in “Installing Caldera UnixWare or Open UNIX on a non-ServeRAID drive” on page 25.

Installing Caldera UnixWare or Open UNIX on a ServeRAID drive: Use the following instructions if you are using multiple disk-storage adapters or controllers and you are installing UnixWare or Open UNIX on a drive attached to a ServeRAID controller.

1. Install all ServeRAID controllers that you intend to use in your server.
2. Using the ServeRAID Manager program, create all of your arrays, and define all of your logical drives.
3. Make a list of all of the ServeRAID controllers, including the order and slot number, installed in the server. To do this:
 - a. Turn on the server.
 - b. If the ServeRAID Mini-Configuration prompt appears, press Ctrl+I. When a server contains more than one ServeRAID controller, a selection window appears.
 - c. The menu lists the ServeRAID controllers in order. Select the first ServeRAID controller from the menu.
 - d. Select **Advanced Functions** from the Main Menu.
 - e. Select **View Controller and PCI Information** from the Advanced Functions menu.
 - f. Record the slot number for the ServeRAID controller; then, press Esc three times to return to the controller-selection window.
 - g. Repeat step 3c through step 3f until you record the slot number for each ServeRAID controller that appears on the selection screen.
4. Turn off the server; then, remove all ServeRAID controllers except the first one on your list.

Note: If one of the ServeRAID controllers that you need to remove is on the system board, you must do one of the following:

- If the CD-ROM drive that you are using to install your operating system is attached to the integrated ServeRAID controller, disconnect or remove all disk drives attached to the integrated controller.
- If only disk drives are attached to the integrated controller, disconnect the SCSI cable from the ServeRAID connector on the system board. See the label inside the server cover for the location of the ServeRAID connector.

5. Remove all other non-ServeRAID IDE and SCSI disk-storage adapters or controllers.

Note: If one of the disk-storage controllers that you need to remove is on the system board, you must do one of the following:

- If the CD-ROM drive that you are using to install your operating system is attached to the integrated disk-storage controller, disconnect or remove all disk drives attached to the integrated controller.
- If only disk drives are attached to the integrated controller, disconnect the cable for the integrated controller from the IDE or SCSI connector on the system board. See the label inside the server cover for the location of the IDE or SCSI controller connector.

6. Follow the instructions in “Installing the device drivers while installing Caldera UnixWare or Open UNIX” on page 26; then, return to this procedure and continue with step 7.
7. Turn off the server.

8. Install any non-ServeRAID disk-storage adapters or controllers in the server; then, attach the drives to the disk-storage adapters and controllers.
9. Install the second ServeRAID controller from the list you created in step 3f on page 24; then, attach the drives to the ServeRAID controller.
10. Turn on the server and wait for the operating system to detect the new disk-storage adapters and controllers.
11. Turn off the server.
12. Repeat steps 9 through 11 until all ServeRAID adapters, ServeRAID controllers, and drives are installed.
13. You can now partition and format the logical drives attached to the additional ServeRAID adapters and controllers. See the information provided with Caldera UnixWare or Open UNIX for more instructions.

Installing Caldera UnixWare or Open UNIX on a non-ServeRAID drive: Use the following instructions if you are using multiple disk-storage adapters or controllers, you are installing Caldera UnixWare or Open UNIX on a drive attached to a non-ServeRAID adapter or controller, and you intend to store only data on the drives attached to your ServeRAID adapters and controllers.

1. Install all ServeRAID controllers that you intend to use in your server.
2. Using the ServeRAID Manager program, create all of your arrays, and define all of your logical drives.
3. Make a list of all of the ServeRAID controllers, including the order and slot numbers, installed in the server. To do this:
 - a. Turn on the server.
 - b. When the ServeRAID Mini-Configuration prompt appears, press Ctrl+I. When a server contains more than one ServeRAID controller, a selection screen appears.
 - c. The menu lists the ServeRAID controllers in order. Select the first ServeRAID controller from the menu.
 - d. Select **Advanced Functions** from the Main Menu.
 - e. Select **View Controller and PCI Information** from the Advanced Functions menu.
 - f. Record the slot number for the ServeRAID controller; then, press Esc three times to return to the controller-selection screen.
 - g. Repeat steps 3c through 3f until you have recorded the slot number for each ServeRAID controller that appears on the selection screen.
4. Turn off the server; then, remove all ServeRAID, IDE, and SCSI disk-storage adapters and controllers except the one attached to the drive where you intend to install Caldera UnixWare or Open UNIX.

Note: If one of the disk-storage or ServeRAID controllers that you need to remove is on the system board, do one of the following:

- If the CD-ROM drive that you are using to install your operating system is attached to the integrated controller, disconnect or remove all disk drives attached to the integrated controller.
- If only disk drives are attached to the integrated controller, disconnect the SCSI or IDE cable for the integrated controller from the connector on the system board. See the label inside the server cover for the location of the SCSI and IDE cable connectors.

5. Follow the instructions in “Installing the device drivers while installing Caldera UnixWare or Open UNIX”; then, return to this procedure and continue with step 6.
6. Turn off the server.
7. Install any non-ServeRAID disk-storage adapters or controllers in the server; then, attach the drives to the disk-storage adapters and controllers.
8. Install the first ServeRAID controller from the list you created in step 3f on page 25; then, attach the drives to the ServeRAID controller.
9. Turn on the server and wait for the operating system to detect the new disk-storage adapters and controllers.
10. Turn off the server.
11. Repeat steps 8 through 10 until all ServeRAID adapters, ServeRAID controllers, and drives are installed.
12. You can now partition and format the logical drives attached to the ServeRAID adapters and controllers. See the information provided with Caldera UnixWare or Open UNIX for more instructions.

Installing the device drivers while installing Caldera UnixWare or Open UNIX

Complete the following steps to install the ServeRAID device drivers while installing Caldera UnixWare or Open UNIX:

1. Use the instructions provided with Caldera UnixWare or Open UNIX to begin the installation.
2. When a message appears asking if you want to install any HBA diskettes, insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette; then, select **Install HBA diskette**.
3. Use the instructions provided in the Caldera manual to complete the normal installation process.

Installing or updating device drivers after installing Caldera UnixWare or Open UNIX

Use the following instructions when you do one of the following:

- Use the UnixWare Pkgadd to install or upgrade the ServeRAID device drivers after installing UnixWare or Open UNIX.
- Use the UnixWare SCOAdmin utility program to install or upgrade the ServeRAID device drivers after installing UnixWare or Open UNIX.

Using Pkgadd to install device drivers

Complete the following steps to install or upgrade ServeRAID device drivers using the Pkgadd utility program:

1. Insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette into the diskette drive.
2. Type the following and press Enter:

```
pkgadd -d /dev/dsk/f0t
```
3. When the message Insert diskette into Floppy Drive 1 appears, press Enter.
4. When the message Installation of IBM ServeRAID SCSI IHV HBA (ips) was successful appears, type the following and press Enter:

```
q
```
5. After the device driver is installed, shut down and restart the server.

Using SCOAdmin to install device drivers

Complete the following steps to install or upgrade ServeRAID device drivers using the SCOAdmin utility program:

1. Insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette into the diskette drive.
2. Start the SCOAdmin utility program by typing SCOADMIN at the system prompt.
3. Click **Software_Management**.
4. Click **Application Installer**.
5. Click the **Install From** tab.
6. Click **Disk_A**.
7. If nothing appears in the window, click **Update View**.
8. When the icon labeled “ips” appears in the window, click **Install**.
9. After the device driver is installed, remove the diskette from the diskette drive; then, shut down and restart the server.

Notices

This publication was developed for products and services offered in the U.S.A.

IBM® may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.*

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this publication to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product, and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Edition notice

**© COPYRIGHT INTERNATIONAL BUSINESS MACHINES CORPORATION, 2002.
All rights reserved.**

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM	OS/2 WARP
Netfinity	ServeRAID
OS/2	ServerProven

Lotus, Lotus Notes, SmartSuite, and Domino are trademarks of Lotus Development Corporation and/or IBM Corporation in the United States, other countries, or both.

Intel, Celeron, LANDesk, MMX, NetBurst, Pentium, Pentium II Xeon, Pentium III Xeon, and Xeon are trademarks of Intel Corporation in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a registered trademark of Linus Torvalds.

Other company, product, or service names may be trademarks or service marks of others.

Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD-ROM drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven[®], including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.